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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/072,176	02/07/2002	Benjamin J. Finn	5538/2012	1323
29933	7590	06/16/2004	EXAMINER	
PALMER & DODGE, LLP KATHLEEN M. WILLIAMS 111 HUNTINGTON AVENUE BOSTON, MA 02199			FLETCHER, MARLON T	
			ART UNIT	PAPER NUMBER
			2837	

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

10/072,176

Applicant(s)

FINN ET AL.

Examiner

Marlon T Fletcher

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 9-25, and 28-31, are rejected under 35 U.S.C. 102(b) as being anticipated by Ghias et al. (5,874,686).

As recited in claims 1, 23, 24, 28, and 30, Ghias et al. disclose an apparatus and method for searching a database of music files (figure 1), comprising: input means (20) to provide search criteria comprising a tune as a sequence of melodic intervals; comparing means (24), for comparing said sequence of melodic intervals with selected portions of a plurality of computer-readable music file (column 2, lines 50-52); and output means (26), to provide a list of possible matches of said search criteria with at least one of said plurality of computer-readable music files (column 2, lines 50-52). Ghias et al. disclose a computer program product, comprising a computer readable medium having thereon computer program code means adapted, such that when said program is loaded onto a computer (figure 1).

As recited in claim 2, Ghias et al. disclose the apparatus, wherein said input means comprises a microphone (20) into which a user can sing, hum or whistle said tune (column 2, lines 41-42).

As recited in claim 3, Ghias et al. disclose the apparatus, wherein said input means comprises a MIDI keyboard for playing the tune (column 7, lines 57-61).

As recited in claim 4, Ghias et al. disclose the apparatus, wherein the input means further includes a pitch recognition means (22) to identify each melodic interval between a succession of musical pitches input as said tune.

As recited in claims 9 and 10, Ghias et al. disclose the apparatus, wherein said comparing means includes means for comparing one or more segments of said tune with said selected portions of said plurality of computer readable music files, and wherein said output means bases the likelihood of a match on the number of separate segments and/or selected portions for which a possible match is indicated, wherein said segments of the search tune and/or said selected portions of the music file are defined as overlapping note sequences (column 2, line 27-34; and column 5, line 66 through column 7, line 8).

As recited in claim 11, Ghias et al. disclose the apparatus according to claim 1 wherein said comparing means includes: means for representing the input sequence of melodic intervals, and b) the selected portions of said plurality of computer-readable music files, each as a function of pitch against time, and means for measuring a closeness of fit to determine a degree of matching of the input sequence to each one of

the selected portions (column 2, lines 27-34 and lines 47-56; and column 3 through column 5).

As recited in claims 12, 13, and 29, Ghias et al. disclose the apparatus, further including transformation means for applying at least one transformation function for measuring a closeness of fit, wherein said at least one transformation function comprises any one of: a translation in pitch; a translation in time; a scaling in time; a variable scaling in time over different parts of the graph; a variable pitch translation over different parts of the graph; and a transformation by removal of selected sections from the graph (column 3, line 61 through column 4, line 26).

As recited in claim 14, Ghias et al. disclose the apparatus, wherein said means for measuring closeness of fit comprises means for determining an error score for a note input sequence compared against a note selected portion of said music file for each of a plurality of values (column 2, lines 52-59).

As recited in claims 15 and 16, Ghias et al. disclose the apparatus, further including means for determining a value of  $n$  for which the error score is minimized, further including means for varying  $n$  about a start value until an error score minimum is attained (column 6, line 3 through column 7, line 56).

As recited in claim 17, Ghias et al. disclose the apparatus, wherein said comparing means includes to identify relevant selected portions of a plurality of computer-readable music files by applying selection criteria to identify portions of the files likely to contain tunes (column 2, lines 47-52; and column 5, line 66 through column 6, line 2).

As recited in claim 18, Ghias et al. disclose the apparatus, wherein said relevant selected portions of said music files are stored in an index (column 2, lines 60-63).

As recited in claim 19, Ghias et al. disclose the apparatus, wherein said relevant selected portions stored in said index are encoded as text, said input means further including means for encoding said sequence of melodic intervals as text string, and said comparing means comprising a text search engine (column 6, lines 23-63).

As recited in claim 20, Ghias et al. disclose the apparatus, wherein the location, in said computer-readable music files, of said relevant selected portions of said music files are indicated by one or more tags, and said comparing means are adapted to locate said tags which is inherent and further discussed in column 3, lines 3-7.

As recited in claim 21, Ghias et al. disclose an apparatus for indexing a music database comprising: means (24) for identifying relevant selected portions of a plurality of computer-readable music files by applying criteria to identify portions of the files likely to contain tunes; and means for tagging said music files to identify positions corresponding to said relevant selected portions (column 2, lines 47-52; and column 3, lines 3-7).

As recited in claim 22, Ghias et al. disclose an apparatus for indexing a music database comprising: means for identifying relevant selected portions of a plurality of computer-readable music files by applying selection criteria to identify portions of the files likely to contain tunes (column 2, lines 47-52); and means for generating an index of said music files containing information representative of said relevant selected portions (column 6, line 60 through column 7, line 8).

As recited in claim 25, Ghias et al. disclose an apparatus for determining a sequence of melodic intervals from an input source comprising: input means for providing an input signal waveform representing a tune; note discretization means comprising means for dividing a frequency-time representation of said input signal waveform into discrete time periods to form a succession of input tune elements and, for each input tune element, determining a single gradient of the input over said time period (column 3, line 61 through column 5, line 65).

As recited in claim 25, Ghias et al. disclose the apparatus, wherein said comparing means further includes means to identify relevant selected portions of said audio files likely to contain tunes by detecting a component of the audio signal which is common to both left and right channels of a stereo pair of channels (inherent in view of that discussed above).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghias et al. in view of Zimmerman (5,563,358).

Ghias et al are discussed above. Ghias et al. do not disclose determining a chromatic interval.

However, Zimmerman et al. disclose teaching or training means, wherein said input means

further includes quantization means to determine a closest chromatic interval, a closest whole tone interval, or a closest minor or major third interval between two successive musical pitches; wherein said input means further includes quantization means to determine a closest major, minor or other scale to which successive musical pitches will fit; further including means to determine, from said input sequence of melodic intervals, a succession of rhythmic intervals and use said succession of rhythmic intervals as further search criteria (column 9, lines 1-28 and column 16, line 44 through column 17, line 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the teachings of Zimmerman with the apparatus of Ghias et al., because Zimmerman et al. provide the teachings of using a chromatic interval as part of comparing and pitch matching techniques which provides more information for providing a match in melodies or tunes.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ghias et al. in view of Lybrook et al. (4,731,847).

Ghias et al. do not disclose the use of text as the input.

However, Lybrook et al. disclose an apparatus, including means (103) to provide as input additional search criteria comprising text information (figure 1).



It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the teachings of Lybrook et al. with the teachings of Ghias et al., because the teachings allow for an alternative input, wherein text can be used as an input to the system.

6. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghias et al.

Ghias et al. do not disclose means for designating the gradient of each element as one of the categories selected from the group consisting of: horizontal / near horizontal; diagonal; and vertical / non-vertical; and means for coalescing adjacent elements of the same category to form compound elements.

However, Official Notice is taken with respect to it being well known in the art to use the gradient and related components for determining points or comparison of an input signal over a period of time.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the well known teachings in the art with the apparatus of Ghias et al., because using the gradient of the input signal and stored signals provides more accuracy in the method of determining a match between signals.

### ***Response to Arguments***

7. Applicant's arguments filed 03/08/2004 have been fully considered but they are not persuasive.


The applicants' arguments are directed toward the "sequence of melodic intervals." The applicants' believe that Ghias et al. fail to disclose melodic intervals as defined by its ordinary meaning in the art. The applicant's provide a dictionary definition which states that an Interval is the "relational distances between two different pitches." As disclosed in the abstract of Ghias et al., "a melody is inputted into a computer ..... representations of relative pitch differences between successive notes." This alone reads on the interval definition. Melody is inputted through a microphone and the database is searched based on the inputted melody. Inherently that melody would contain intervals, defined as different pitches between different notes. Even without the description pointed out in the abstract, the limitation is met by reference.

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marlon T Fletcher whose telephone number is 571-272-2063. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on 571-272-2107. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306.



Marlon T Fletcher  
Primary Examiner  
Art Unit 2837



MTF

June 14, 2004